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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,410

11/14/2003

Stephan Oberle

Westphal.7377

2025

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EXAMINER

KRAUSE, JUSTIN MITCHELL

ART UNIT

PAPER NUMBER

3682

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/714,410	Applicant(s) OBERLE ET AL.	
	Examiner Justin Krause	Art Unit 3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6 and 8-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6 and 8-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 17, 2007 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6, and 8-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The "linear contact" is indefinite. It is unclear which direction the linear contact occurs, and how the linear contact occurs over the height of each of the teeth when as clearly shown in the drawings, the entire height of the teeth is not in contact.

The term "when" renders claim 1 indefinite because it is unclear if the limitations following the term "when" will occur. The limitations are optional since it is unknown if or when the device will satisfy those limitations.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 1-4, 6, 8, 10 and 12-17, as best understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Shimizu et al (US Patent 6,543,569).

Regarding claims 1, 15 and 17, Shimizu discloses a gear mechanism with a rotatable first gear and a rotatable second gear (33 and 34, 133 and 134, or 113 and 112), each having teeth via which they engage each other and include a concave and a convex region meshing with portions of the concave and convex regions of the other gear such that during rotation linear contact over the height of the teeth comes about when the teeth engage. (Fig 1)

Regarding the limitations of how the gears mesh with each other, the recitation is regarded as functional language, having anticipated all of the claimed structure, the device of Shimizu is capable of performing the claimed function. See MPEP 2114.

Regarding claims 2-4, 12 and 14, the tooth profile is a circular arc (non-involute) and each tooth has a convex and concave region of approximately equal curvature, the concave region is disposed in a region adjoining a tooth base and the convex region is

disposed in a region adjoining a tooth tip. (Col 12, line 62-Col 13, line 57 and Figures 8a-8d).

Regarding claim 6, the first gear is a worm gear (113) and the second gear is a worm (112).

Regarding claim 8, the thicknesses are adapted to the material properties of the first and second gears.

Regarding claim 13 and 16, the first gear is made from metal (112) and the second gear (113) is made using resin or plastic, which is lower strength than the metal worm. (Col 11, lines 28-31)

Regarding claim 10, the worm wheel is cylindrical (Fig 6).

Claim Rejections - 35 USC § 103

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu as applied to claims 1 and 8 above, further in view of Pickles (US Patent 2,760,381).

Shimizu does not disclose the tooth thickness of the teeth of the worm gear is greater than that of the teeth of the worm.

Pickles teaches a worm and worm wheel arrangement where the worm gear is a weaker material than the worm and the thickness of each tooth on the worm wheel being greater than one half the circular pitch and the thread of the worm being less than one half the circular pitch, the increased tooth thickness increases the strength of the weaker gear wheel while not increasing the amount of unnecessary material on the worm. (Col 1, lines 60-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shimizu to include the larger tooth thickness on the worm gear made of weaker material for the desired purpose of increasing strength of the weaker worm gear while not adding unnecessary material to the worm as taught by Pickles.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu as applied to claim 1, and further in view of Scott (US Patent 2,279,414).

Shimizu does not disclose the second gear to be globoidal.

Scott teaches a globoidal worm engaging a worm wheel, the globoidal shape making it possible to increase the possible bearing between the thread flanks of the worm and tooth flanks of the worm wheel when carrying a heavy load. (pg 1, lines 5-11)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shimizu to include a globoidal shaped worm for the desired purpose of increasing the possible bearing between the thread flanks of the worm and tooth flanks of the worm wheel and increase the load carrying ability as taught by Scott.

Response to Arguments

Applicant's arguments filed January 17, 2007 have been fully considered but they are not persuasive.

Applicant argues that that Shimizu is not readable on the independent claims because applicant's claimed invention requires concave and convex regions to mesh with a portion of the concave and convex regions of the other gear while in Shimizu the entire surface profiles contact.

The entire surface profile does not contact, as there is a space left in the root portion of the tooth profile making a portion of the concave and convex regions mesh.

Regarding applicants argument that the gearing in Shimizu is helical and therefore linear contact cannot occur, applicant's invention involves a worm gear, which is inherently helical, and would operate in the same manner, that is, the contact would move in an arc across the surface of the worm gear tooth. As shown in figure 5, the contact regions are connected by a line, which is clearly shown in the drawing to be non-linear. Since it is unclear which direction it is even possible for applicant's invention to have linear contact, it is also unclear in what way applicant's claimed invention is different from the contact in Shimizu.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Krause whose telephone number is 571-272-3012. The examiner can normally be reached on Monday - Friday, 8:30-5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3682

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

2/15/07


Thomas R. Hannon
Primary Examiner